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SERVICES

HEARING ON CRITICAL SKILLS FOR NATIONAL SECURITY AND
THE HOMELAND SECURITY FEDERAL WORKFORCE ACT .

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Thank you very much Mr. Chairman, Ranking Member, and Members of the Committee on Governmental Affairs for the opportunity to appear at this hearing on "Critical Skills for National Security and The Homeland Security Federal Workforce Act."

The National Security Agency (NSA) is the nation's cryptologic organization and, as such, employs this country's premier codemakers and codebreakers. A high-technology organization, NSA is on the cutting edge of information technology. Founded in 1952, NSA is a separately organized Agency within the Department of Defense and supports military customers and national policymakers.

NSA's mission is to exploit secret foreign communications and produce foreign intelligence information while protecting U.S. communications. "Exploiting" communications is referred to as signals intelligence (SIGINT); "protecting" is known as information assurance (IA). These are capabilities in which the United States leads the world. NSA's greatest strength lies in its highly talented civilian and military workforce. Possessing a wealth of critical skills and expertise, this workforce includes mathematicians, intelligence analysts, linguists, computer scientists, and engineers. In fact, NSA is said to be the largest employer of mathematicians in the United States and perhaps the world. NSA is also one of the most important centers of foreign language analysis and research within the Governwent.

As we address the serious challenges facing our nation today, it is imperative that we remember that our people are key to constructing the unified, end-to-end enterprise needed to achieve and maintain information superiority for America. The intelligence business is fundamentally about skills and expertise, and this means people - people in whom we need to invest to prepare them to deal with the array of complex issues they will tackle over the next generation. No system or tecluiology by itself will enable us to master the new threat environment or manage the glut of information we will face in the years ahead. We need a skilled and expert workforce enabled by technology and armed with the best analytic tools. We have spent significant sums of money acquiring technology and developing technical solutions. Our employees must use that technology to maximum benefit, particularly those individuals with expertise and training in mathematics, science, foreign languages, and the other analytic disciplines, as capabilities in those fields are at the very core of our critical intelligence mission and are vital to our future success.

Upon reporting for duty in the Spring of 1999, the Director of NSA initiated a transformation of our workforce designed to focus our employees

on the mission, to strip away needlessly bureaucratic processes, to change our ethos, and to maintain staffing levels in critical areas. The events of September 11th reinforced our need to transform the Agency, confirmed we were on the right path, showed that we must increase the pace of transformation, and ultimately underscored the value of people and their contributions to producing intelligence. If nothing else, the *events of* September 11d' highlighted the fact that there is no single solution to the threats facing our nation. 'therefore, a balanced, multidisciplinary approach is the only answer. Teams of individuals with varied skills, working together and employing the latest technology, in collaborative and creative ways, are our best defense against the threats of the 21" Century.

To create these collaborative teams, NSA relies on a unique combination of specialties. Analysts, engineers, physicists, mathematicians, linguists, and computer scientists are key to that mix. *These* individuals team as necessary to meet ever-changing requirements. Our Director describes the modern day employee not so much as a football player, with a set position, playing offense or defense, but rather as a soccer player, moving to the spot where opportunity presents itself, shifting from offense to defense on the same play, throughout the game, as required. So, while there are certainly specific roles that our employees play, we gain great advantage from their ability to adapt to new situations and fill a number of different needs. For example, cryptanalysts (those individuals working at the very core of our SIGTNT and IA missions) use mathematics, computer programming, engineering, and language skills, as well as new technologies and creativity, to solve complex intelligence problems. That is why NSA is looking for people who are intelligent and imaginative critical thinkers who can contribute original ideas to the solution of our most difficult challenges. In fact, no single field of academic study is targeted for cryptanalysis; NSA hires people with technical and non-technical degrees, ranging from mathematics to music, engineering to history, and computer programming to chemistry.

Our workforce today includes many individuals representing the best in their chosen fields. We have numerous subject matter experts who have a wealth of indepth knowledge to bring to bear in service of the nation. In addition, among our communities of mathematicians, engineers, computer scientists, linguists, analysts, and those in related technical fields, we count those who have chosen to apply their skills across the intelligence disciplines. Many of our most successful computer scientists and signals analysts hold advanced mathematical degrees; a number of our analysts have computer science and telecommunications backgrounds; mathematicians contribute directly to both of our missions by designing cipher systems to protect U.S. information systems and searching for weaknesseq in our adversaries'

systems; engineers apply their skills in a number of critical cryptologic areas; language analysts make some of our best intelligence analysts; and, in fact, everyone is encouraged to gain experience across organizations and missions. We also encourage participation in interdisciplinary assignments and training to provide additional professional breadth. This range of experience allows virtually seamless hAerface among many of our disciplines.

Certainly, **mathematics, science, foreign language, and analysis will always be critical requirements for NSA.** With the increased volume, velocity, and variety of globalized network communications, there has been a growing need for our mathematicians, engineers, computer scientists and those in related technical disciplines to have expertise in new skill areas. Aniong those areas *are Network* Security, Vulnerability Analysis, Public Key Infrastructure, Data and Fiber Optics Communications, Image Processing, Encryption, Biometrics, Database Management, and Data Visualization. There has been a similar broadening in the scope of contributions of our language analysts, who are now going well beyond their more traditional applications of language expertise and target analysis to tackle network exploitation and SIGINT development. The blurring of the lines between the technical and the analytic disciplines is an ongoing and. inevitable outcome of the increasingly tecluiical nature of our work and the sophistication and complexity of our targets.

No discussion of resources would be complete without a specific mention of our continued need for qualified linguists. The need for competent and near-native language capability is critical to our success, today, and tomorrow. However, there has been a significant de-emphasis within the United States in the instruction of foreign languages, which makes it increasingly difficult to recruit new hires to keep the language pool healthy. Although we cannot resolve this on our own, we are taking steps to address it. We are now sponsoring a new outreach program for language to incentivize such a capability in partnership with flagship schools. This initiative will be modeled after our successful math program where we have established relationships with faculty and students at a number of institutions, funded research, provided grants and scholarships and encouraged mathematics programs at all levels.

hl the mid-1990s, NSA focused heavily on technology as the solution for many of its complex challenges. Facing massive technological advances, while downsizing and trying to maximize our return on investment, the Agency focused its hiring and development initiatives on computer science, engineering and mathematics at the expense of language and analysis. This was largely due to the belief that better technology would increase the capability of analysts to process large amounts of data more effectively and

efficiently. While that has undoubtedly been the case, the loss over the last several years of experienced linguists and analysts has created difficulties for the Agency in target knowledge, less commonly taught languages, and in training of the next generation of analysts_ As we strive for better balance, we have tried to maintain a robust and fairly consistent mathematics hiring program, looked more to private industry and contracting for technical skills, reenergized our linguist and analyst hiring and revitalized our cryptologic reserve program. These cryptologic reservists, former employees who are brought back into Agency service to augment our workforce for short periods of time, play a key role in meeting surge requirements and providing particular technical or target expertise.

While a strong analytic and technical skill base is an absolute requirement, we must also auguleiit these skills with managers, systems engineering experts, project managers, and support personnel. The leaders who shape the technical and analytic working environment over the next decade must have superior skills for developing and mentoring our workforce at all levels and mission areas. They must apply sound business practices, coupled with innovative personnel management and ensure that all segments of the workforce succeed in meeting our national mission requirements.

Technology and the world change rapidly, and great emphasis is placed on staying ahead of these changes with employee training and development programs. The Department of Defense and its components develop and maintain strategies and programs for ensuring the recruitment and professional development of its employees, and NSA is taking hull advantage of a wide variety of these programs. Just 5 months into the fiscal year, NSA has hired approximately half of its FY2002 target of 800 new employees and we are finishing up an extraordinarily successful FY2001 hiring program. Like many other Agencies, NSA has struggled over the years to attract top talent to Government, yet we have had success attracting new recruits with the quality, complexity, depth, and scope of our work; our commitment to continuing education and development (as evidenced by our Cooperative Education Program, and our Skills Enhancement Recruitment Incentive Program-a scholarship program for new hires in mathematics and the sciences); the payment of Foreign Language incentives; targeted hiring and retention bonuses; continuing education opportunities; and our work life initiatives. All of those benefits and programs notwithstanding, the market continues to be a challenge for us, especially to meet our goals in the sciences and less conunonly taught languages. As a result, we continuously pulse the market with the goal of being as competitive as possible.

Our people remain the key to NSA's success in achieving information superiority in the 21" century and beyond. As our Signals Intelligence

Director recently stated before Congress, "I would be remiss if I did not emphasize here that our most valuable asset - our engineers, mathematicians, linguists, analysts and all the rest - have made the difference. And it is the talent and will of our people that continue to give me confidence." We remain dedicated to those efforts that will ensure that we have a work force, with the right people with the right skills in the right jobs. We have made progress shaping our workforce, shifting our skill mix, and deploying our people as effectively as possible. We are committed to recruiting, hiring, and retaining the highly educated, technically sophisticated, and readily adaptable corps of skilled individuals required to meet the mission challenges posed by new targets and new technologies_ As we transform the Agency, we will continue to provide the vital information that will enable the United States to maintain a decisive edge in information superiority.

Thank you Mr. Chairman and Members of the committee for giving me the opportunity to testify before you today.